

Acknowledgements

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B.L.G.

*Universität Bern, Mineral.-Petrograph. Institut,
Sahlstrasse 6, 3012 Bern, Switzerland.*

T.E.K.

*Geophysical Laboratory,
Carnegie Institution of Washington,
2801 Upton Street, Washington D. C. 20008, U.S.A.*

K/Ar AGES OF MICA LAMPROPHYRES FROM SOUTHERN EAST GREENLAND

J. G. Mitchell

Interpretations in collaboration with J. R. Andrews

K/Ar age determinations have been carried out on three dyke samples from a suite of post-tectonic mica lamprophyres in the inner parts of Danells Fjord and Pâ-tussoq (Andrews *et al.*, 1971 & in prep.). The dykes were intruded through a metamorphosed supracrustal sequence and in turn transected by an east-west trending dolerite in Danells Fjord.

The following dates indicate that the dykes belong to two episodes of activity which form part of the evolution of the Gardar igneous province of South Greenland. An east-west trending pyroxene-mica lamprophyre dyke was intruded

about 1400 m.y. ago followed some 200 m.y. later by less basic north-east trending carbonatite-mica lamprophyre dykes. A date of 1275 ± 25 m.y. was obtained on biotite from an early lamprophyre at Ivigtut (Larsen & Møller, 1968); the oldest Gardar age previously recorded. Isotope ages of other Gardar events are discussed in Bridgewater (1965).

Table 5 summarises the K/Ar dates obtained and the localities of the samples dated are indicated in fig. 6.

Table 5. K/Ar age determinations from southern East Greenland

GGU sample no.	Approx. coordinate position	K ₂ O%	Radiogenic ⁴⁰ Ar (mm ³ gm ⁻¹)	% Atmospheric contamination	Age Million Years
126543	60° 55' N, 43° 29' W	6.97 ± 0.10	(3.51 ± 0.05) 10 ⁻¹	3.4	1115 ± 15
			(3.60 ± 0.04) 10 ⁻¹	2.6	1140 ± 15
126565	60° 54' N, 43° 22' W	7.89 ± 0.03	(3.92 ± 0.05) 10 ⁻¹	3.9	1105 ± 15
			(3.86 ± 0.05) 10 ⁻¹	4.2	1090 ± 15
126577	60° 51' N, 43° 26' W	4.28 ± 0.04	(2.99 ± 0.04) 10 ⁻¹	3.5	1415 ± 15
			(2.90 ± 0.04) 10 ⁻¹	1.8	1390 ± 15

Decay constants: $\lambda_e = 0.584 \times 10^{-10} \text{ yr}^{-1}$; $\lambda_\beta = 4.72 \times 10^{-10} \text{ yr}^{-1}$; $^{40}\text{K}/\text{K} = 1.19 \times 10^{-2}$ atom per cent.

The ages and sample descriptions

1130 ± 20 m.y. biotite

GGU 126543. Danells Fjord, 60°55' N, 43°29' W.

An undeformed 50 cm fresh mica-carbonatite lamprophyre trending north-east and cutting low-grade greenschists. Tabular and lath-shaped phenocrysts, now pseudomorphed by chlorite are set in a groundmass of carbonate, mica, plagioclase and opaque oxides. The alteration of the phenocrysts is thought to be deuteric. Lath-shaped phenocrysts with original feldspar are still occasionally preserved.

1100 ± 20 m.y. biotite

GGU 126565. Danells Fjord, 60°53' N, 43°22' W.

Another member of the north-east swarm similar to 126543. This 1 metre dyke cuts semi-pelitic metasediments. Phenocrysts with hexagonal and prismatic sections are again pseudomorphed though less abundant. Additional groundmass phases are alkali-amphibole (? riebeckite) and clinopyroxene (? titanogite). Plagioclase is more abundant whilst biotite and particularly carbonate are diminished.

1400 ± 25 m.y. biotite

GGU 126577. Pátussoq, 60°50' N, 43°20' W.

This dyke which gives a significantly greater age is more basic in character and trends east-west. Clinopyroxene is abundant as phenocrysts (ca. 30% and in the groundmass ca. 20%), poikilitic biotite, carbonate and opaque oxides forming the remaining groundmass phases.

Discussion

The K/Ar ages are believed to represent emplacement ages since the respective dykes are demonstrably post-tectonic (Andrews *et al.*, 1971; in prep.) and the regional K/Ar "cooling" ages from the country rocks are grouped between 1500 and 1600 m.y., isotopic ages which are widespread in South Greenland (see previous GGU Reports of Activities). Concordant K/Ar ages from Danells Fjord dykes support the belief that their emplacement age is close to 1100 m.y. No such definite conclusion may be drawn from the single sample age from Pátussoq which may be older than the K/Ar age indicates, namely 1400 m.y., but its post-tectonic character would suggest that its age must lie between about 1600 m.y. and 1400 m.y. The ages given by the samples are unlikely to have been significantly affected either by argon loss (usually indicated by discordant ages from related samples) or by the presence of "excess" argon.

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*School of Physics, The University,
Newcastle upon Tyne NE1 7EU, England.*

K/Ar DATES FROM THE FREDERIKSHÅB REGION, SOUTHERN WEST GREENLAND

Ole Larsen

The dating laboratory at the Institute of Petrology, University of Copenhagen, has made 8 K/Ar age determinations on 7 samples of Precambrian gneiss and granite from the area between Kvanefjord and Neria fjord. The ages reported on here (summarised in table 6) are the first half of a series of K/Ar age determinations to be made covering the region between Frederikshåbs Isblink to the north and Neria fjord to the south.